

WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule consisting of a polynucleotide having a nucleotide sequence selected from the group consisting of:
  - a) a polynucleotide fragment of SEQ ID NO:1 or a polynucleotide fragment of the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1;
  - b) a polynucleotide encoding a polypeptide fragment of SEQ ID NO:2 or a polypeptide fragment encoded by the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1;
  - c) a polynucleotide encoding a polypeptide domain of SEQ ID NO:2 or a polypeptide domain encoded by the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1;
  - d) a polynucleotide encoding a polypeptide epitope of SEQ ID NO:2 or a polypeptide epitope encoded by the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1;
  - e) a polynucleotide encoding a polypeptide of SEQ ID NO:2 or the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1, having biological activity;
  - f) a polynucleotide which is a variant of SEQ ID NO:1;
  - g) a polynucleotide which is an allelic variant of SEQ ID NO:1;
  - h) a polynucleotide which encodes a species homologue of the SEQ ID NO:2;
  - i) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:1;

- j) a polynucleotide corresponding to nucleotides 4 to 954 of SEQ ID NO:1;
- k) a polynucleotide corresponding to nucleotides 1 to 954 of SEQ ID NO:1; or
- l) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(k), wherein said polynucleotide does not hybridize under stringent conditions to a nucleic acid molecule having a nucleotide sequence of only A residues or of only T residues.

2. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding a G-protein coupled receptor protein.

3. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding the sequence identified as SEQ ID NO:2 or the polypeptide encoded by the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1.

4. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises the entire nucleotide sequence of SEQ ID NO:1 or the cDNA sequence included in ATCC Deposit No:PTA-2682, which is hybridizable to SEQ ID NO:1.

5. The isolated nucleic acid molecule of claim 2, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

6. The isolated nucleic acid molecule of claim 3, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

7. A recombinant vector comprising the isolated nucleic acid molecule of claim 1.

8. A method of making a recombinant host cell comprising the isolated nucleic acid molecule of claim 1.
9. A recombinant host cell produced by the method of claim 8.
10. The recombinant host cell of claim 9 comprising vector sequences.
11. An isolated polypeptide comprising an amino acid sequence at least 95% identical to a sequence selected from the group consisting of:
  - a) a polypeptide fragment of SEQ ID NO:2 or the encoded sequence included in ATCC Deposit No:PTA-2682;
  - b) a polypeptide fragment of SEQ ID NO:2 or the encoded sequence included in ATCC Deposit No:PTA-2682, having biological activity;
  - c) a polypeptide domain of SEQ ID NO:2 or the encoded sequence included in ATCC Deposit No:PTA-2682;
  - d) a polypeptide epitope of SEQ ID NO:2 or the encoded sequence included in ATCC Deposit No:PTA-2682;
  - e) a full length protein of SEQ ID NO:2 or the encoded sequence included in ATCC Deposit No:PTA-2682;
  - f) a variant of SEQ ID NO:2;
  - g) an allelic variant of SEQ ID NO:2;
  - h) a species homologue of SEQ ID NO:2; or
  - i) a polypeptide corresponding to amino acids 2 to 318 of SEQ ID NO:2.
12. The isolated polypeptide of claim 11, wherein the full length protein comprises sequential amino acid deletions from either the C-terminus or the N-terminus.
13. An isolated antibody that binds specifically to the isolated polypeptide of claim 11.
14. A recombinant host cell that expresses the isolated polypeptide of claim 11.

15. A method of making an isolated polypeptide comprising:
- a) culturing the recombinant host cell of claim 14 under conditions such that said polypeptide is expressed; and
  - b) recovering said polypeptide.
16. A polypeptide produced by claim 15.
17. A method for preventing, treating, or ameliorating a medical condition, comprising administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 11 or the polynucleotide of claim 1.
18. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:
- a) determining the presence or absence of a mutation in the polynucleotide of claim 1; and
  - b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or absence of said mutation.
19. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:
- a) determining the presence or amount of expression of the polypeptide of claim 11 in a biological sample; and
  - b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or amount of expression of the polypeptide.
20. A gene corresponding to the cDNA sequence of SEQ ID NO:2.
21. A method of identifying an activity in a biological assay, wherein the method comprises:
- a) expressing the HGPRBMY4 sequence as set forth in SEQ ID NO:2 in a host cell having; and
  - b) measuring the resulting activity of the expressed HGPRBMY4.

22. A method for identifying a binding partner to the polypeptide of claim 11 comprising:

- a) contacting the polypeptide of claim 11 with a binding partner; and
- b) determining whether the binding partner effects an activity of the polypeptide.

23. A method of identifying a compound that modulates the biological activity of HGPRBMY4, or a GPCR, comprising:

- a) combining a candidate modulator compound with a host cell containing a vector according to claim 7, wherein HGPRBMY4 is expressed by the cell; and
- b) measuring an effect of the candidate modulator compound on the activity of the expressed HGPRBMY4.

24. A compound that modulates the biological activity of human HGPRBMY4 as identified by the method according to claim 21, 22, or 23.

25. The method of claim 22 wherein said binding partner is a peptide.

26. A method of treating a disease, disorder, or condition related to the colon, breast, ovaries, or immune system, comprising administering the G-protein coupled receptor polypeptide or homologue according to claim 11 in an amount effective to treat the lung-, colon-, brain-, heart-, or prostate-related disorder.

27. The polynucleotide of claim 2, further comprising a polynucleotide localized in lung, colon, brain, prostate, heart, colon carcinoma, or lung carcinoma cell lines.

28. The polypeptide of claim 11, further comprising a polypeptide expressed in lung, colon, brain, prostate, heart, colon carcinoma, or lung carcinoma cell lines.

29. A cell comprising NFAT/CRE and the polypeptide of claim 11.

30. A cell comprising NFAT G alpha 15 and the polypeptide of claim 11.

31. A method of screening for candidate compounds capable of modulating activity of a G-protein coupled receptor-encoding polypeptide, comprising:

- a) contacting a test compound with the cell of claim 29 or 30; and
- b) selecting as candidate modulating compounds those test compounds that modulate activity of the G-protein coupled receptor polypeptide.

32. The method according to claim 31, wherein the candidate compounds are agonists or antagonists of G-protein coupled receptor activity.

33. The method according to claim 32, wherein the candidate compounds are peptides.

34. The method according to claim 32, wherein the polypeptide activity is associated with the lung, colon, brain, heart, or prostate.